Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	WT Docket 11-79
Wireless Telecommunications Bureau Seeks	)	DA 11-838
Comment on Spectrum Needs for the	)	
Implementation of the Positive Train Control	)	
Provisions of the Rail Safety Improvement	)	
Act of 2008	)	
Public Notice Regarding AMTRAK Request	)	WT Docket 11-27
for Waiver of Certain Part 80 AMTS Rules	)	DA 11-322
to Implement Positive Train Control	)	

To: The Commission

Ex Parte Comments of Hammett & Edison, Inc., Consulting Engineers

This further Hammett & Edison (H&E) *ex parte* filing is in response to the November 30, 2011, *ex parte* filing of American Public Transportation Association (APTA); that filing in turn provided a copy of a November 2011 report by Stantec Consulting Services, Inc., *PTC Radio Spectrum Planning for Passenger Commuter Rail Operators in the United States* ("Stantec Report").

I. The Greatly Expanded Use of AMTS for PTC is an Interference Threat to Over-the-Air Reception of TV Channels 10 and 13 That Must Be Considered

1. The proposed greatly expanded use of Automatic Maritime Telecommunications System (AMTS) A and B Block frequencies at 217–218 MHz for Positive Train Control (PTC) has, in our opinion, so far not adequately addressed the impact of such operation on the over-the-air reception of TV Channels 10 and 13. It is therefore the purpose of this filing to ensure that the docket record reflects this issue, and to further ensure that the reception of TV Channel 10 and 13 signals is protected.

2. AMTS was originally intended as a Part 80 Maritime Radio Service, providing communications service to inland waterways. The limited number of maritime base stations were required to demonstrate that their operation would not cause half-Intermediate Frequency (Half-IF) interference to TV Channel 10 signals at 192–198 MHz, nor adjacent-channel interference to TV Channel 13 signals at 210–216 MHz. To that end, in 1982 the Commission's Office of Engineering and Technology (OET) published technical memorandum TM82-5, *Guidance for Evaluating the Potential for Interference to TV from Stations of Inland Waterways Communications Systems*.

3. Of course, in 1982 digital television (DTV) did not exist, so the TM82-5 study was based on protecting National Television Systems Committee (NTSC) analog TV Channel 10 and analog TV Channel 13 signals. Although in June 2009 full-service analog TV transmissions ceased in the United States, the Section 80.215 AMTS interference protection rules were never updated to reflect protection of *digital* Channel 10 and *digital* Channel 13 signals. While on the one hand DTV signals have inherent coding isolation against interference that analog TV signals did not, the protected contour for VHF high band (Channels 7–13) TV signals changed from the F(50,50) 56 dBu contour to the F(50,90) 36 dBu contour, and the generally allowable ERP for VHF high band TV stations decreased from 316 kW to 30 kW ERP. Further, while the reception of an analog TV signal failed gracefully, meaning that reception was still possible, albeit with increasingly degraded video and audio signal quality, DTV reception is all-or-nothing. That is, for DTV, the transition from a perfect picture to no reception ("blue-screen squelch") is abrupt, typically no more than a 1 dB window. Thus, viewers get no feedback why they cannot receive a particular DTV signal; instead, test equipment and technical knowledge is needed to diagnose non-reception of a DTV signal.

4. Use of Part 80 AMTS Maritime frequencies for Part 90 Land Mobile train control is a change in the FCC allocation methodology. Compounding the problem is the use of AMTS for PTC for passenger commuter rail operators (PCROs), which means that PTC base stations would likely be placed along the track right-of-way, using short towers. Since only heavily populated urban areas need PCROs, this means that there would also likely be significant population on both sides of the tracks. Some of these residences will be in the coverage areas of over-the-air DTV Channel 10 and/or DTV Channel 13 TV stations and would be at risk of receiving interference from PTC transmissions using AMTS A or B Block spectrum.

II. Interference Analysis

5. A 1995 Advisory Committee on Advanced Television Service (ACATS) report did investigate the interference potential of a narrow band interfering signal to a DTV signal. Figure 3-2 from the ACATS report, reproduced here as Figure 1, suggests for a narrow band interfering signal 1 MHz above the channel edge, a D/U ratio of -49 dB defines the threshold of visibility (TOV). If an AMTS PTC signal would have the same interference potential, which we think might well be the case, then an estimate of the interference area that a PTC base station inside the coverage area of a Channel 13 DTV station could be estimated. The interference area estimate could be further simplified by assuming that over the coverage area of a PTC base station the D13 signal strength can be treated as a constant value.

6. The VHF high band DTV Threshold is the F(50,90) 36 dBu. For a hypothetical AMTS PTC base station with a 500-watt ERP, the following interference distances can be estimated:

D13 Field Strength	AMTS PTC Interfering Contour	Free Space Distance
76 dBu (strong signal)	125 dBu	290 feet
56 dBu (medium signal)	105 dBu	2,900 feet
36 dBu (weak signal)	85 dBu	29,000 feet

These distances are based on free space, and do not take into account the elevation pattern of the hypothetical AMTS PTC base station; nevertheless, they demonstrate potentially large areas along a PCRO's right-of-way where there would be a potential for chronic TV Channel 13 interference. They also assume that the D/U ratio found by ACATS for weak-signal conditions would continue to apply for moderate and strong signal conditions.

7. We have no information about the half-IF interference case to Channel 10 TV stations. The appropriate D/U ratio for half-IF interference needs to be derived for that case. We would hope, though, that it would be no worse (*i.e.*, no more susceptible) than for the adjacent-band case, but updated measurements of consumer-grade DTV receivers would be required to verify this.

III. Summary

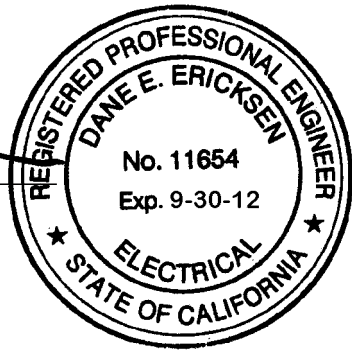
8. Before it can be in the public interest to consider repurposing AMTS frequencies to a Land Mobile radio service used for Positive Train Control, updated information about the susceptibility DTV Channel 10 and DTV Channel 13 signals needs to be derived. In our view, this task is precisely appropriate for the Commission's OET Laboratory. Once updated information is available for D/U signal ratios necessary to ensure that consumer-grade DTV receivers do not receive interference from nearby AMTS A and B block base stations being used for PTC in heavily populated urban areas, it will be possible for the Commission to determine whether it would be in the public interest to re-allocate AMTS to a Land Mobile radio service.

List of Figures

9. The following figure has been prepared as a part of these WT Docket 11-79 *ex parte* comments:

Respectfully submitted,

By _____
William F. Hammett, P.E.
President



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February 10, 2012

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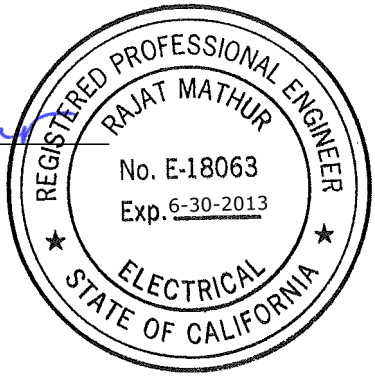

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Excerpt from 1995 ACATS Report

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from the October 1995 ACATS Record of Test Results report

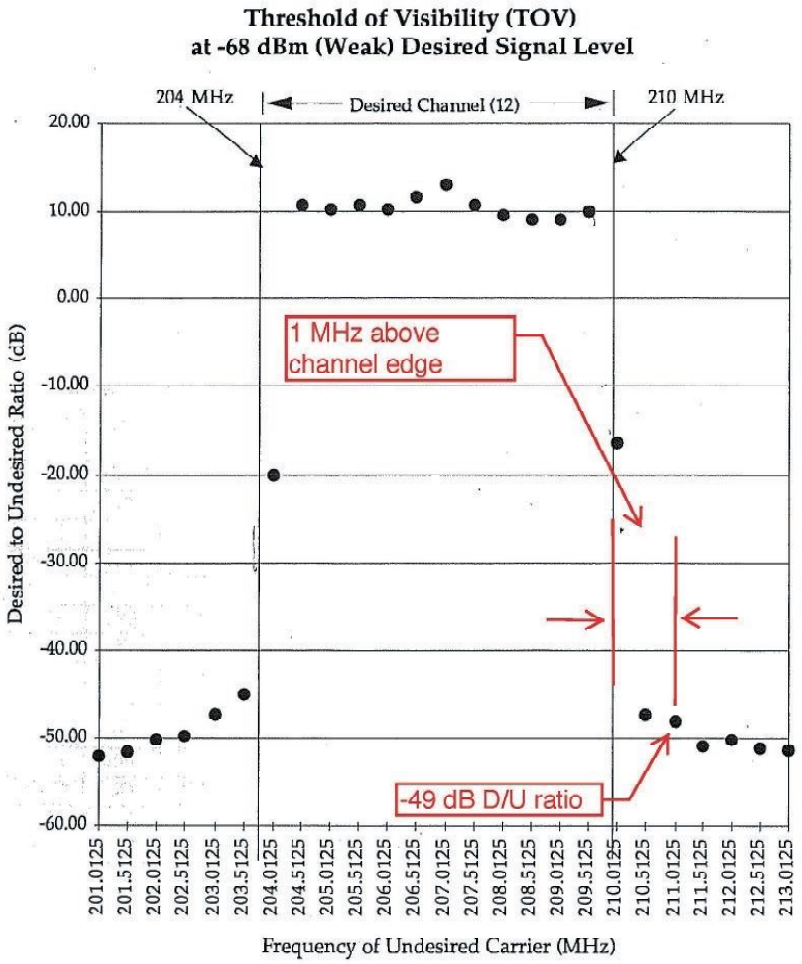

Figure 3-2

Grand Alliance System